3. Reconsideration of the rejection of claims 21 and 23-25 under 35 U.S.C. 102(e) as being anticipated by Cheek et al., U. S. Patent 6,018,180, is respectfully requested for the following reasons.

To distinguish the applicant's claim 21 from the prior art of Cheek et al., claim 21 is amended as follows: On line 33 the word --and-- is inserted before the word "providing." On line 34 the word --conformal-- is inserted before the word "continuous," the words --ion implanted-- are inserted before the words "doped region," and the phrase --in said substrate-- is inserted after the words "doped region" on lines 34-35. On line 35, the word "around" is replaced with --surrounding-- and the word --unintentional-- is inserted before the word "over-etched." Lines 36-38 are amended by adding the phrase --, and said ion implanted doped region is shallower than said source/drain contact areas-- to further distinguish the applicant's structure from Cheek et al.

The applicant's contact-opening implant dopant in diffused region G (see Applicant's Fig. 4) is formed after etching the contact openings 2 in insulating layer 28, which results in over-etched regions X at the interface between the STI 12 and the substrate 10. By virtue of this sequence of the process steps, the diffused region G is conformal and continuous around the over-etched region X. (See

description of Fig. 4 in applicant's specification, pages 18-19.)

Cheek et al. form the diffused region 380 (Fig. 5) using a photoresist mask and then remove the photoresist mask. An insulating layer 440 is deposited and contact openings 450 are etched over that diffused area 380. Because of Cheek's sequence of process steps, the over-etching resulting in voids 460 at the interface 456 can extend past the diffused region 380 resulting in shorts. Since the etch uniformity can vary across the wafer, Cheek's structure can result in shorts. Since the applicant's structure has the diffused region G in the over-etched region X, the applicant's structure is insensitive to shorting as a function of the variation in depth of the over-etched region X that can occur across the wafer.

Because of the differences in the process steps, the applicant's structure is quite different from Cheek's structure. The applicant's claim 21 may have been better expressed as a structure-by-method claim. However, the above structure claim 21 was written to avoid having to write a structure-by-method claim.

These amendments should now distinguish the applicant's claim from the prior art. The applicant's arguments from the reply dated Sept. 3, 2002 to Office Action dated June 14,2002, cited below, are still valid.

The structure in the prior art of Cheek et al. cited by the Examiner is significantly different from the applicant's structure.

There are three major differences between the prior-art structure of Cheek et al. and the applicant's structure.

1. Cheek et al. form a diffused region 380 by implanting (see col. 7, lines 19-31) using a photoresist mask 370 (see Fig. 5) prior to depositing an insulating layer 440 and etching a contact opening 450. Therefore, the void 460 (Fig. 10) is etched into the field oxide 220 and can be etched below (over-etched) the diffused region 380, causing shorts.

The applicant's implant is performed (see Fig. 4) after etching the opening 2, as shown in Fig. 3, and is therefore implanted in the over-etched region X, as shown in Fig. 4. Therefore, the implant region G is conformal to the over-etched region X, and is independent of how deep the over-etched region of the STI is.

2. As pointed out above Cheek et al. use a separate photoresist mask 370 (col. 6, lines 15-34) to ion implant the region 380 (col. 7, lines 29-31) before depositing the insulating layer 440 (col. 7, lines 44-49) in which trenches L1 (contact openings) 450 are etched (col. 7, lines 49-51). Therefore, Cheek's diffusion 380 cannot be self-aligned to the opening 450.

The applicant's implanted region G (see Fig. 4) is done after the opening 2 is etched, and therefore the implanted

region G is self-aligned to the opening 2 and is also self-aligned to the over-etched region X in the STI 12.

3. Cheek et al. must form the diffused region 380 deeper than the source/drain region 320 to effectively prevent shorts when the void 460 is etched in the STI oxide 220 below the junction 340 of the source/drain region 320.

The applicant does not need to implant below the source/drain area 19′ to prevent shorts. Therefore, the source/drain areas can remain shallow, as required for advanced high-performance circuits.

The applicant's relatively low-energy implant in the region X at the STI-source/drain interface effectively forms a diffused region G conformal to the region X that prevents shorts, as shown in Fig. 4.

The applicant's structure is not anticipated by Cheek et al. and therefore is patentable over Cheek et al.

Claims 23-25 are dependent claims that do not stand on their own merits but support the independent claim 21.

6. Reconsideration of the rejection of claim 22 under 35 U.S.C. 103(a) as being unpatentable over Cheek et al. is respectfully requested for the following reasons.

Claim 22 is a dependent claim that does not stand on its own merits but supports the independent claim 21.

It is requested that Examiner A. Roman call the undersigned Attorney at (845) 452-5863 should there be anything that can be done to help bring this Patent Application to Allowance.

Respectfully submitted,

Stephen B. Ackerman

Reg. No. 37,761

PLEASE AMEND THE CLAIMS - MARKED-UP COPY

21. (TWICE AMENDED) A Salicide field effect transistor with improved borderless contact openings comprised of:

a semiconductor substrate doped with a first conductive type dopant and having device areas surrounded and electrically isolated by shallow trench field oxide areas;

a gate oxide layer on said device areas, and a conductively doped patterned polysilicon layer doped with a second conductive type dopant over said device areas for gate electrodes;

lightly doped source/drain areas with said second conductive type dopant in said device areas adjacent to said gate electrodes and [an] insulating sidewall spacers on the sidewalls of said gate electrodes;

heavily doped first source/drain contact areas composed of said second conductive type dopant in said device areas adjacent to said insulating sidewall spacers;

a silicide layer on said gate electrodes and on said source/drain contact providing said Salicide field effect transistors;

a conformal barrier layer, and an interlevel dielectric layer on said Salicide field effect transistor;

borderless contact openings in said interlevel dielectric layer and said barrier layer to said source/drain areas and extending over said field oxide with unintentional over-etched field oxide regions at said field oxide-source/drain area interface;

a dopant composed of said second conductive type in said substrate under and adjacent to said over-etched field oxide regions in said borderless contact openings and providing said source/drain contact areas with a conformal continuous ion implanted doped region in said substrate [around] surrounding said unintentional over-etched field oxide regions, and said ion implanted doped region is shallower than said source/drain contact areas.